

G21 may be a characteristic graph when the first and second switches SW1 and SW2 are in a turned off state, a graph G22 may be a characteristic graph when only the second switch SW2 is in a turned on state, and a graph G23 may be a characteristic graph when only the first switch SW1 is in a turned on state.

[0202] Referring to the graph shown in FIG. 10A, it is shown that the middle bands B3, B2, and B1 of approximately 1700 MHz through 2200 MHz corresponding to the first middle band f_M1 may be covered by the first antenna apparatus 500, and the plurality of low bands B20, B5, and B8 of 700 MHz through 1000 MHz may be covered by the first antenna apparatus 500 depending on the state of the first and second switches SW1 and SW2.

[0203] In FIG. 10B, the existing graph G10 may be a characteristic graph of the existing electronic device, a graph G31 may be a characteristic graph when the third switch SW3 is in a turned off state, and a graph G32 may be a characteristic graph when the third switch SW3 is in a turned on state.

[0204] Referring to the graph shown in FIG. 10B, it is shown that the middle bands B3, B2, and B1 of approximately 1700 MHz through 2200 MHz corresponding to the second middle band f_M2 may be covered by the second antenna apparatus 700, and the plurality of high bands B30 and B7 of 2,300 MHz through 2,700 MHz may be covered by the second antenna apparatus 700 depending on the state of the third switch SW3.

[0205] As set forth above, according to the embodiment, the electronic device with the conductive border member may use the non-segmented conductive border member to control a low band, a middle band, and a high band, thereby supporting the carrier-aggregation (CA) while securing the antenna performance depending on the frequency environment or the system environment and implementing 1UL/2DLs or 1UL/3DLs.

[0206] As set forth above, according to the embodiments, an electronic device including a multi-band antenna, a cover, a substrate, and a conductive border includes a first feed terminal connected to a circuit of a substrate embedded in the device, a second feed terminal connected to the circuit and insulated from the first feed terminal, a ground disposed on the substrate, a conductive border member continuously disposed along a periphery of the electronic device, a first antenna connected to the first feed terminal and the conductive border member, and the first antenna forming a multiple resonance for covering a first multi-band having a plurality of bands, a second antenna connected to the second feed terminal and the conductive border member and the second antenna forming a multiple resonance for covering a second multi-band, and a or the bypass conductor to bypass interference signals generated by the first antenna and the second antenna to the ground.

[0207] While this disclosure includes specific examples, it will be apparent to one of ordinary skill in the art that various changes in form and details may be made in these examples without departing from the spirit and scope of the claims and their equivalents. The examples described herein are to be considered in a descriptive sense only, and not for purposes of limitation. Descriptions of features or aspects in each example are to be considered as being applicable to similar features or aspects in other examples. Suitable results may be achieved if the described techniques are performed in a different order, and/or if components in a described system,

architecture, device, or circuit are combined in a different manner, and/or replaced or supplemented by other components or their equivalents. Therefore, the scope of the disclosure is defined not by the detailed description, but by the claims and their equivalents, and all variations within the scope of the claims and their equivalents are to be construed as being included in the disclosure.

What is claimed is:

1. An electronic device, comprising:

- a first feed terminal connected to a circuit of a substrate embedded in the electronic device;
- a second feed terminal connected to the circuit and electrically insulated from the first feed terminal;
- a ground disposed on the substrate;
- a conductive border member continuously disposed along a periphery of the electronic device;
- a first antenna connected to the first feed terminal and the conductive border member, and forming a multiple resonance for covering a first multi-band having a plurality of bands;
- a second antenna connected to the second feed terminal and the conductive border member and forming a multiple resonance for covering a second multi-band; and
- a bypass conductor configured to bypass interference signals generated by the first antenna and the second antenna to the ground.

2. The electronic device of claim 1, wherein the first antenna comprises:

- a first antenna pattern disposed along an edge of a cover of the electronic device, the first antenna pattern having one end connected to the first feed terminal and the conductive border member and the other end open, and having a first electrical length; and
- a first bridge antenna pattern disposed on the cover and pattern having one end connected to the first antenna pattern and the other end connected to the conductive border member.

3. The electronic device of claim 2, wherein the first antenna further comprises:

- a first outer conductor comprising a portion of the conductive border member from a first point connected to the first feed terminal and the first antenna pattern to a second point spaced at a second electrical length apart from the first point in a first direction; and
- a second outer conductor comprising a portion of the conductive border member from a third point of the conductive border member to a fourth point spaced at a third electrical length apart from the third point in a second direction, and

wherein the second point is connected to the ground, the third point is connected to the other end of the first bridge antenna pattern, and the fourth point is connected to the bypass conductor.

4. The electronic device of claim 3, wherein the second antenna comprises:

- a second antenna pattern disposed on the cover, the second antenna pattern having one end connected to the second feed terminal and the other end open, and the second antenna pattern having a fourth electrical length; and